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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/692,011  
Filing Date: October 24, 2003  
Appellant(s): NAKAJIMA, KENJI

**MAILED**  
**JAN 25 2008**  
**GROUP 1600**

Keiko K. Takagi  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed October 26, 2007 appealing from the Office action mailed October 26, 2006 and in accordance with the Pre-Appeal Conference, wherein the Panel Decision from Pre-Appeal Brief Review was mailed May 24, 2007.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings, which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

This appeal involves claims 2, 3, 5, 6, 8, 9, 11, and 12.

Claims 1, 4, 7, 10, and 13-20 have been withdrawn from consideration previously.

Typos have been noted in the Office Action Summary (PTOL-326) in the Final Rejection dated October 26, 2006. Under claims rejected in the Office Action Summary (PTOL-326), claim 10 has been inadvertently indicated as being rejected and claim 12 has been inadvertently not included as being rejected. All claims under consideration (claims 2, 3, 5, 6, 8, 9, 11, and 12) have been rejected in the Final Rejection dated October 26, 2006 (p2, item 4). Therefore, the rejected claims in the Office Action Summary (PTOL-326) in the Final Rejection dated October 26, 2006 should indicate claims 2, 3, 5, 6, 8, 9, 11, and

Art Unit: 1641

12, which is consistent with the rejection set forth in the Final Rejection dated October 26, 2006 (p2, item 4) and the Status of Claims Section of the Brief filed October 26, 2007.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

5,358,691	CLARK et al.	10-1994
6,716,629	HESS et al.	4-2004

### **(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 2, 3, 5, 6, 8, 9, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hess et al. (U.S. Patent No. 6,716,629 B2, filed on Oct. 10, 2001) in view of Clark et al. (U.S. Patent No. 5,358,691, Oct. 25, 1994).

Hess et al. reference teaches the step of providing a platen (biochemical analysis unit; base plate) with an array of through-holes traversing the platen, the

through-holes having a three-dimensional hydrophilic scaffold placed therein (i.e. porous adsorptive regions comprising holes filled with a porous material), and wherein the scaffold is activated to couple biological materials within the holes (i.e. bound receptors). See column 13, line 65 to column 14, line 3; and column 20, lines 45-62. In addition, Hess et al. teach that platen can be used to screen for ligands by affinity (i.e. performing a specific binding detection process) by performing the step of applying pressure across the platen to create a flow of sample through the array of through-holes, where the sample is a second set of reagents that can react with reagents already loaded into the through-holes (i.e. forcibly causing a ligand to flow through the holes; ligand subject to specific binding with bound receptors). See column 35, lines 32-42; and column 28, lines 16-22. Furthermore, Hess et al. teach that specific binding can be detected by applying a radiolabeled sample protein to an array of 100,000 different proteins in the platen, applying a wash step, and then detecting the presence of radiolabeled protein by a phosphor-imaging system (i.e. detecting the receptor by the utilization of a labeling substance; labeled receptor). See column 55, line 64 to column 56, line 7. Hess et al. also teach that all through-holes can be loaded (i.e. through each of the holes). See column 7, lines 14-15.

However, Hess et al. fail to teach the step of performing a bubble removing or dissolving process during the flowing of the liquid.

Clark et al. reference teaches the step of automatically flushing bubbles out of a fluidics system, in order to prevent the presence of air bubbles from

affecting the precision and accuracy of the dispenser. See column 21, lines 7-48.

It would have been obvious to one of ordinary skill in the art to modify the method of Hess et al. with the step of automatically flushing bubbles out of the fluidics system, as taught by Clark et al., in order to prevent the presence of air bubbles from affecting the precision and accuracy of the dispenser. The advantage of providing more accurate dispensing of solution provides the motivation to combine the bubble-extracting step of Clark et al. in the method of Hess et al. In addition, one of ordinary skill in the art at the time of the invention would have had a reasonable expectation of success in including the bubble extracting step of Clark et al. in the method of Hess et al., since Hess et al. teach the step of dispensing fluid into an array, and the bubble extracting process of Clark et al would provide a more effective way of dispensing the fluid.

With respect to claims 11-12, Hess et al. teach that nucleic acids can be labeled with an enzyme (i.e. auxiliary substance-bound receptor) such as horseradish peroxidase and then incubated with a substrate that produces a luminescent, fluorescent, or chromogenic signal upon reaction with the enzyme flowing binding and washing steps (i.e. causing a labeling substance to bind to the auxiliary substance, and detecting the auxiliary substance bound receptor by utilization of the labeling substance). See column 36, lines 2-9.

**(10) Response to Argument**

Appellant's arguments in the Brief on appeal have been fully considered but have not been found persuasive essentially for the reasons of record.

Appellant's arguments center on the allegation that there is no motivation to combine Hess et al. and Clark et al. references. Appellant's rationale is that since Clark et al. teaches the flushing of bubbles out of a syringe, this step cannot be applied to the pressure system of Hess et al. Specifically, Appellant asserts "Hess does not disclose that there are any problems with bubble formation when pressure is applied" (p16, 2<sup>nd</sup> paragraph of the Brief). Secondly, Appellant asserts that the disclosure relied upon by the Examiner (Hess et al.) relates to the application of pressure and not to the use of a syringe" (p16, 2<sup>nd</sup> paragraph of the Brief). Appellant further argues that the there is no reasonable expectation of success in employing the bubble removal system of Clark et al. in the system of Hess et al. (p16, last paragraph-p17, 2<sup>nd</sup> paragraph of the Brief).

Appellant's arguments have been fully considered but are not persuasive to overcome the rejection under 35 U.S.C. 103(a) as being unpatentable over Hess et al. in view of Clark et al. In response to Appellant's assertion that Hess et al. does not describe bubble formation, the systems of Hess et al. and Clark et al. are different since Hess applies "pressure" and Clark uses a "syringe", and there is lack of reasonable expectation of success, as long as there is motivation

to combine references and there is a reasonable expectation of success in making the combination, the combination is proper. Regarding the reasonable expectation of success, while Hess et al. does not explicitly describe bubble formation, it does not follow that Hess et al.'s system would not have problems with bubbles and that Clark et al.'s bubble-removal process would not work with the system of Hess et al. Contrary to Appellant's statement that Hess et al. and Clark et al. apply two different systems, "pressure" vs. "syringe", one of ordinary skill in the art at the time of the invention would recognize that both systems employ pressure differential in a fluidic system in order to provide fluid flow. Moreover, Hess et al. teaches that the pressure can be applied using mechanical or optical pressure (column 23, lines 17-20). For example, Hess et al. discloses that pressure can be applied in the form of a solid pin acting as a piston (column 11, lines 54-65). Since the syringe of Clark et al. uses the same mechanical principle of providing pressure in the fluidic system using a plunging/thrusting motion (via the syringe plunger), one of ordinary skill in the art would reasonably expect that the problems with bubbles would exist in the fluidic system of Hess et al. Therefore, since both Hess et al. and Clark et al.'s systems apply pressure in a fluidics environment, one of ordinary skill in the art at the time of the invention would also recognize that Clark et al.'s bubble-removal step would apply to other pressure-based fluidics systems, including the system of Hess et al.

Regarding Appellant's arguments with respect to the motivation requirement, the mere physical distinction between Hess' platen and Clark et al.'s syringe does not automatically prevent their combination in teaching the present claims. Although Appellant asserts that motivation is lacking, the motivation is provided in the previous Office Action on page 4, 1<sup>st</sup> paragraph, and the rejection restated in the Grounds of Rejection Section of this Examiner's Answer. The motivation for combining Clark's bubble-extracting step with Hess' assay method is to provide the advantages of a more precise and accurate dispensation, by removing bubbles from a fluidic system.

Further, given the examination guidelines for determining obviousness under 35 U.S.C. 103 in view of the Supreme Court decision in *KSR International Co. v. Teleflex Inc.* 82 USPQ2d 1385 (2007) and the Examination Guidelines set forth in the Federal Register (Vol. 72, No. 195, October 10, 2007) and incorporated recently into the MPEP § 2143 (Revision 6, September 2007), the following rationales to support rejection under 35 U.S.C. 103(a) are noted:

A) Combining prior art elements according to known methods to yield predictable results.

The rationale to support a conclusion that the claims would have been obvious is that all the claimed elements (method using a biochemical analysis unit for performing flow through assay in order to detect a receptor or ligand) were known in the prior art and one skilled in the art could have arrived at the claimed invention by using known methods

(bubble-removal step applied to pressure-based fluidics systems such as syringe) with no change in their respective functions and the combination would have yielded nothing more than predictable results of more precise and accurate dispensation, by removing bubbles from a fluidic system.

B) Simple substitution of one known element for another to obtain predictable results.

The rationale to support a conclusion that the claims would have been obvious is that the substitution of one known element (pressure system of Hess et al.) with another (syringe with a bubble removal system of Clark et al.) would have yielded predictable results of more precise and accurate dispensation, by removing bubbles from a fluidic system.

D) Applying a known technique to a known product ready for improvement to yield predictable results.

The rationale to support a conclusion that the claims would have been obvious is that a particular known technique (a bubble removal system of Clark et al.) was recognized as part of the ordinary capabilities of one skilled in the art. One of ordinary skill in the art would have been capable of applying this known technique to a known product (pressure-driven fluidic system of Hess et al.) that was ready for improvement (more precise and accurate dispensation) and the results would have been predictable to one of ordinary skill in the art.

E) "Obvious to try" --- choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success.

The rationale to support a conclusion that the claim would have been obvious is that a person of ordinary skill has good reason to pursue the known options (syringe with a bubble removal system of Clark et al.) within his or her technical grasp. This leads to the anticipated success of more precise and accurate dispensation, by removing bubbles from a fluidic system. Therefore, it is likely the product not of innovation but of ordinary skill and common sense.

G) Some teachings, suggestion, or motivation in the prior art that would have lead one of ordinary skill to modify the prior art reference to arrive at the claimed invention.

Since the improvement of dispensing fluids more effectively would have been predictable at the time of the invention, there would have been reasonable expectation of success in modifying the method of Hess et al. with the step of automatically flushing bubbles out of the fluidics system, as taught by Clark et al. as claimed. The prior art (Clark et al.) had recognized the advantage of providing more accurate dispensing of solution by removing bubbles in the fluidic system. The claims were obvious because it would have been obvious to modify the method of Hess et al. with the known method of automatically flushing bubbles out of the fluidics system, as taught by Clark et al., in order to prevent the

presence of air bubbles from affecting the precision and accuracy of the dispenser with a reasonable expectation of success.

"The test of obviousness is not express suggestion of the claimed invention in any or all of the references but rather what the references taken collectively would suggest to those of ordinary skill in the art presumed to be familiar with them." See *In re Rosselet*, 146 USPQ 183, 186 (CCPA 1965).

"There is no requirement (under 35 USC 103(a)) that the prior art contain an express suggestion to combine known elements to achieve the claimed invention. Rather, the suggestion to combine may come from the prior art, as filtered through the knowledge of one skilled in the art." *Motorola, Inc. v. Interdigital Tech. Corp.*, 43 USPQ2d 1481, 1489 (Fed. Cir. 1997).

An obviousness determination is not the result of a rigid formula disassociated from the consideration of the facts of a case. Indeed, the common sense of those skilled in the art demonstrates why some combinations would have been obvious where others would not. See *KSR Int'l Co. v. Teleflex Inc.*, 82 USPQ2d 1385 (U.S. 2007) ("The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.").

Art Unit: 1641

Given that the prior art goal was to improve precision and accuracy of the dispenser, modifying the method of Hess et al. with the known method of automatically flushing bubbles out of the fluidics system as taught by Clark et al. would have been routine to the ordinary artisan at the time the invention was made.

In conclusion, given that the prior art (Clark et al.) teaches that removing bubbles in the fluidic system provides more accurate dispensing of solution, it would have been obvious to one of skill in the art at the time of the invention to achieve the predictable results of enhancement of dispensing accuracy by removing bubbles in the fluidic system as claimed.

Therefore, the invention as a whole was *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references, especially in the absence of evidence to the contrary.

Appellant's arguments have not been found persuasive.

#### **(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

Art Unit: 1641

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Unsu Jung/

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Art Unit 1641

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